AUGUST • 1953

American Vegetable Grower

POINTERS ON IRRIGATION

THE ALL-PURPOSE
SPRAYER-DUSTER

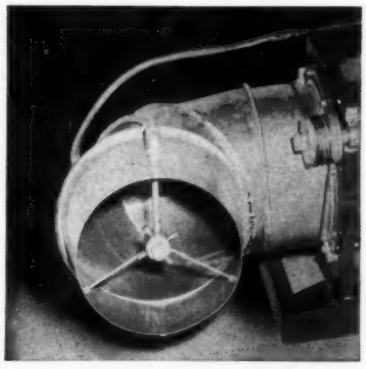
WHY VEGETABLE GROWERS ARE BUYING CONCENTRATE EQUIPMENT

When the idea of developing concentrate spray equipment was first discussed, a number of suggestions were made. These suggestions came from Experiment Stations, chemical companies and growers who were particularly interested in reducing the cost of the annual spray bill. In summarizing the outstanding suggestions, we found that the following items were of extreme importance to the growers:

1. Spraying equipment should be light as possible in order not to unduly pack ground between rows.
2. It should be easily operated by one man.
3. The original cost of the equipment should be reduced substantially.
4. Expensive operation and maintenance should be reduced.
5. The equipment should be constructed to handle concentrate materials which afford greater control and less cost.

The next step was to combine these many suggestions into one piece of machinery which would meet all of the requirements. After a good deal of field testing, this was accomplished in the Buffalo Turbine Concentrate Sprayer. The Buffalo Turbine was the first concentrate sprayer manufactured, and today with many improvements is doing a more than adequate job for hundreds of vegetable grower owners. The Buffalo Turbine, because it is a concentrate sprayer and because it is designed to meet modern vegetable growing conditions, embodies the following important characteristics:

1. 20%-40% less in original cost.
2. Dust Bin being optional makes it possible for growers to dust when necessary.
3. One-man operation.
4. 75% less in weight.
5. 50% less maintenance cost.
6. Can be pulled by the smallest of field tractors.
7. All-steel-plated liquid tank insures long service.
8. All moving parts which come in contact with caustic spray materials are stainless steel, brass or plated.
9. Less chemical material is needed per tree.
10. Practically no run-off.
11. Greater Penetration.
12. This machine is completely universal—growers can use concentrate liquids, dusts, or both. The equipment can be used in vegetable work, field crops, weed and brush control, and with the simple change of air nozzles, for orchard work.



All growers who wish to increase their profits in 1953 should have the facts on the Buffalo Turbine. If you will write us today, we will be glad to send you full particulars.

BUFFALO TURBINE
AGRICULTURAL EQUIPMENT
COMPANY, INC.
GOWANDA, NEW YORK

American

VEGETABLE GROWER

(Formerly Commercial Vegetable Grower)

Vol. 1 • AUGUST, 1953 • No. 8

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JOHN BEAN CAN HELP YOU CUT POTATO HARVESTING COSTS ½

It's true. Actual cost figures kept by one Ohio grower show that the John Bean Potato Harvester saved him almost $100 a day in labor costs alone. With 100 acres of potatoes his total labor savings for the 40-day harvesting season were more than enough to pay for the John Bean Potato Harvester itself. All this in just one season. But dollar savings through reduced labor are not all you get from a John Bean Potato Harvester . . .

YOU GET RELEASE FROM MANPOWER SHORTAGES

A crew of 3 to 5 and the John Bean Potato Harvester will do the work of 15 to 20 hand pickers. In most cases you can harvest up to 75 acres with your regular crew — avoid the problem of hiring an "'army" of pickers just when labor demand is the highest. You are sure of getting your crop to market at the most profitable time.

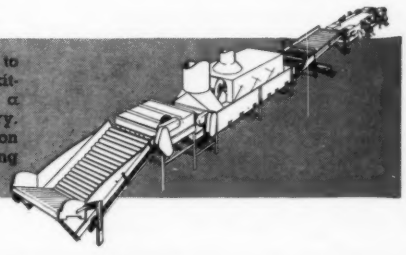
YOU HARVEST MORE POTATOES

Crop yield can be increased by as much as 10% because the John Bean Potato Harvester gets all the potatoes. Hidden potatoes that are easily overlooked by hand pickers are delivered directly to the elevating conveyor.

YOU GET A CLEANER, MORE PROFITABLE CROP

The conveyor belts handle potatoes gently and eliminate much of the loose dirt. Then the exclusive Bean system of mechanical separation removes stones and trash. Careful tests show that with a yield of 300 bushels per acre you will store about 138 pounds less dirt and trash per acre when you use a Bean Potato Harvester.

To reduce frost loss, and to market more profitable "kitchen clean" potatoes, use a John Bean Potato Laundry. Send for a free booklet on extra profits from cleaning and drying potatoes.



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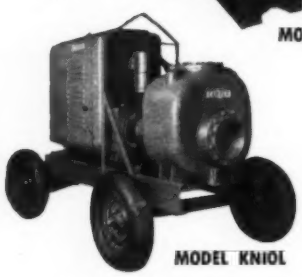

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LETTERS TO THE EDITOR

Promote Your Vegetables

Dear Editor:

I was particularly interested in the June issue of AMERICAN VEGETABLE GROWER and the article, "Let's Promote Vegetables." Here in New England, a great deal of work on promotion to benefit our New England vegetable growers has been done by Lou Webster, director of the Massachusetts Division of Markets.

For example, last year Lou Webster and Max Fultz, associate county agent of Middlesex County, Massachusetts, picked up 35 dozen ears of freshly picked corn at the Thomas J. McGrath farm and took it to the air conditioned studios of radio station WHDH for a corn eating contest. For nearly half an hour the radio entertainers ate corn. It was a race, and the rules were "clean down to the cob," with the winner cleaning a cob in a fraction over 20 seconds.

Lou Webster, center, discusses promotion of vegetables with Barney Wiseberg, left, and Joe Gandolfo, chain store buyers.

Sixty ears of corn were eaten during the show and the balance was given to the guests to take home. All this promotional stunt required was corn and a pound of butter. As a result corn sales climbed during an otherwise slack period.

Promoting local grown produce when chain stores aren't buying has presented another problem. Here again, Lou Webster goes to work, makes a date with a number of top buyers, and invites local vegetable growers in for a discussion period. To make it more interesting, he has on hand good varieties of top quality vegetables with identifying labels removed. The setting is the same as a wholesale market, and the buyers are turned loose. They get a chance to pick over the produce and say whether they would buy or reject it.

It was found that the largest amount of vegetables are sold by eye-appeal. Buyers claim vegetables like summer squash, wax beans, and cauliflower must have perfect color. These experts claim customers will buy spotted vegetables early in the season but when their own gardens are full they are particular what they buy.

In order to increase sales of vegetables you've got to promote them like Lou Webster.

Hollis, N. H. Charles L. Stratton

Prepackaged Preferred

Dear Editor:

I was very interested in the July issue of AMERICAN VEGETABLE GROWER with the articles on prepackaging. I believe that the prepackaged vegetables, top quality of course, are a boon to the busy housewife; and I must say the grocery shelf with the attractive display of prepackaged produce certainly is superior to the cluttered bin, chuck full of vegetables. In other words, it's the "eye-appeal" that counts with the little woman!

Benton Harbor, Mich. Mrs. R. C. James

Vegetable Irrigation Proves Profitable

Dear Editor:

I have enjoyed reading the AMERICAN VEGETABLE GROWER and have found much interesting and useful information. I am particularly interested in ways to increase our vegetable production.

Our own experience has proved that since installing five lines of irrigation pipe in our vegetable garden, we have increased our vegetable production by about 300 per cent, to say nothing of vastly increasing the quality of our vegetables. Now we can plant in dry weather without waiting for rain, get immediate germination, and keep every crop growing straight through the season without any check until harvest.

Our irrigation lines come with nozzles spaced every 10 feet with a special union on the end of each, fitted with a strainer to keep sediment from getting into the line and clogging up the nozzles.

Since we run our rows in the same direction as the pipe line, we can water a narrow strip the entire length of the field any time we see fit. This is especially handy when we are setting out young plants or just after sowing seed in dry weather.

We grow vegetables and flowers for local trade, and since having the water system we have had such a surplus that we sell to out-of-town customers—especially during midsummer when all the rest of the gardens around are more or less dried up. In August folks from miles around come to our farms because they know that they can get nice fresh, crisp vegetables.

Water and enough of it makes anything grow, and it pays well.

Hammonton, N. J. Mrs. Mary Nicastro

A Good Start

Dear Editor:

Please enter my subscription for the AMERICAN VEGETABLE GROWER for three years. My check for $2 is enclosed.

You really started off with a "bang," and if you keep up the good work there will definitely be a place for you. Don't forget the vegetable for processing.

Baltimore 13, Md. Jesse M. Huffington

Wants Information on Soil Fumigation

Dear Editor:

I enjoyed reading the article on page 11 of the June issue of AMERICAN VEGETABLE GROWER entitled "Soil Fumigation." I would like further information concerning the subject of fumigation. Would you please give me the name of the author or the source from which it came, as we would like to know more about soil fumigation in relation to carrots.

Vahlsing Agricultural Chemical Corp.
Elsa, Tex. George C. Bourns

We are glad to hear that Reader Bourns liked our story on soil fumigation. For further information, write C. E. Dieter, Dow Chemical Company, South Haven, Mich.

CALENDAR OF COMING MEETINGS & EXHIBITS

Aug. 6—Empire State Potato Club summer field day, Schuler's Farms, Inc., Cato, N. Y.—Philip Luke, Chairman, Trade Show Committee, R. 3, Fulton, N. Y.

Aug. 12-14—Ohio Pesticide Institute annual tour. Originates at Ohio Agricultural Experiment Station, Wooster, and ends at Northwest Test Farm, Hoytville—J. D. Wilson, Sec'y, Wooster.

Sept. 23-25—Florida Fruit and Vegetable Association 10th anniversary convention, Casablanca Hotel, Miami Beach—Geo. M. Talbott, Mgr., 29 S. Covit St., Orlando.

Oct. 4-10—Produce Prepackaging Association 3rd annual conference and exposition, Chase Hotel, St. Louis, Mo. Association headquarters: 1250 East Main St., Stamford, Conn.

Oct. 5-7—Texas Citrus and Vegetable Growers and Shippers convention, Shamrock Hotel, Houston, Texas. Association headquarters: 306 E. Jackson St., Harlingen, Texas.

Oct. 23-24—Annual Potato Festival, Klamath Basin, Ore., sponsored by Merrill Lions Club. Potato queen will be selected.

Nov. 10-12—Western Growers Association annual meeting, Hotel de Coronado, Coronado, Calif. Association headquarters: 606 South Hill, Los Angeles 14. C. B. Moore, Exec. Vice-Pres.

Nov. 30-Dec. 4—Vegetable Growers Association of America annual convention. Chase Hotel, St. Louis, Mo. Convention exhibits and arrangements: Dr. H. D. Brown, VGAA Sec'y, Ohio State University, Columbus 10, Ohio. Publicity: Max Chambers, Preston, Md.

Dec. 6-12—National Junior Vegetable Growers Assn. annual convention, Tulsa, Okla. Write Prof. Grant Snyder, Univ. of Mass., Amherst, for data.

Dec. 10-11—Iowa State Vegetable Growers' Association 40th annual convention, Hotel Hanford, Mason City, Iowa—C. L. Fitch, Sec'y-Treas., Ames.

TWO NEW VARIETIES OF HEAD LETTUCE

ALASKA and Jade are the names of two new varieties of head lettuce recently developed by the USDA.

Alaska was so named when it proved especially suited to that territory, where it has outyielded the good yielders Great Lakes and Cornell 456 and has shown resistance to anthracnose to which both those varieties are susceptible. It is large, dark green, late maturing, late bolting, and tipburn resistant. It also does well in various places in the states but not better than Great Lakes.

Jade is large, very dark green, leaves heavily savoyed (wrinkled and curled), and cold resistant. In three-season tests in the irrigated valleys of the Southwest this new midseason variety has outyielded Imperial 152 and Imperial 44. Its most valuable characteristic is its cold resistance to late stages of growth, and it can be grown so as to mature between the fall and winter crop, the coldest period in these valleys. Jade also shows promise for the early spring crop in the Middle Atlantic states.

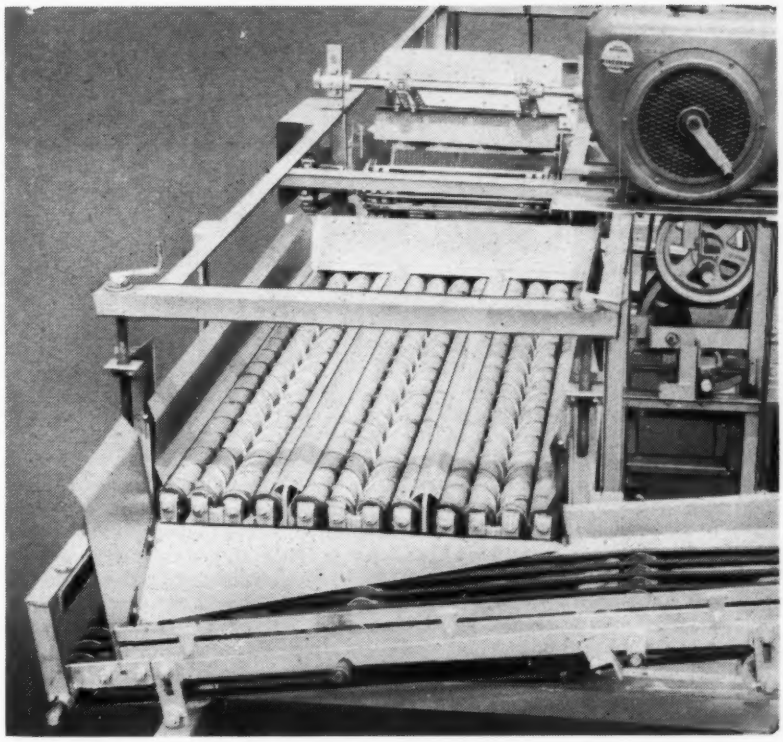
Seedsmen will have these two new varieties for sale for fall planting.

YOU NEED BRUNER MACHINES *FOR*

Profits and Production

- ONION - RED BEET - TURNIP - RADISH - CARROT -

- and POTATO GROWERS -



This is a rear view of the 12 roller vegetable combine. These rollers, whether used in a stationary or mobile topper unit or in the combine in an 8 or 12 roller job. In all set-ups they have won the name as being the only rollers that do not injure the vegetable.

Radish growers have found these amazingly gentle rollers to be fine for topping red radishes to go into cellophane bags. We have brought this great labor saving equipment to these specialty farming operations.

Write for literature and prices on rotary "in the row" weeders; Rotary onion and red beet pullers, vegetable toppers; special "onion set" topper cleaners; onion "pick up" units, and the greatest of all—Bruner vegetable Harvester.

— WRITE TODAY —

FARM IMPLEMENT SPECIALTY SALES COMPANY
22516 Hoover Road DEPT. 3, Van Dyke, Michigan

The VEGETABLE Situation

INSUFFICIENT rainfall in the South Central states, abnormally high temperatures in the North Central states, and June high winds in Minnesota and Michigan have caused crop prospects to be lower than were formerly forecast. Despite this situation, however, prospective production of summer commercial vegetables and melon crops for fresh market is still 4 per cent above the 1949-51 average.

TOMATOES

A drastic 30 per cent drop in the indicated production for the five late spring tomato areas brings the present prediction to 2,031,000 bushels. This figure is 24 per cent below last spring's late crop and 34 per cent below the 10-year average. Severe drought conditions in the South Central states were largely responsible for this, and in some sections of East Texas and Louisiana crops were a complete loss.

POTATOES

Total figures for the winter crop in Florida and Texas show the harvest to be 55 per cent greater than last year and more than double the 1942-51 average. The Florida yield equalled the 1949 record, but the Texas harvest was substantially below average.

Early spring crops in Florida and Texas were 13 per cent greater than last year's record and 68 per cent above the 10-year average, although, again, Texas production was down—30 per cent below last year.

Highest recorded late spring yields are reported from Louisiana and Alabama, and harvests have been relatively good in Mississippi, Arizona, and North Carolina. However, hot, dry weather during May and June has damaged crops, and relatively low prices have caused considerable abandonment in some of the important late spring producing areas.

Production for the summer harvest has proved to be less than expected a month ago because of the hot, dry weather, and damage has been extensive in Kansas and Missouri. However, Maryland expects substantially larger yields than were predicted earlier. Low prices have influenced the Virginia summer crop, while spring freeze damage, heat, drought, and rather widespread disease damage have caused a reduction of the Texas crop.

Indications are that the whole year's crop will be 29 million bushels greater than last year's.

ONIONS

Yields of the early summer crop have been lower than predicted in the six early summer states, but the 1,947,000 50-pound sacks harvested provide a crop which is 11 per cent above last year's production and 21 per cent above the 10-year average. Heavy seeders and maggot and mold damage reduced the Washington crop, and high temperatures combined with low rainfall hurt Oklahoma production, but New Jersey's crop showed a slight improvement.

Preliminary estimate of acreage for the late summer storage crop is up 8 per cent over last year, the figure being placed at 62,650 acres. Acreage in the eight Central states, however, is 2 per cent below last year's, and is 11 per cent below the 10-year average.

Considerable wind and hail damage are reported from Minnesota and Michigan, and cold weather at planting time has thinned Colorado's crop. Early abandonment of acreage has been larger than usual in both Washington and Colorado.

CAULIFLOWER

Indicated production of the late spring crop is up 4 per cent over earlier forecasts and is now placed at 573,000 crates, 17 per cent above last spring's late crop. However, summer crops from New York and Colorado are expected to be 11 per cent smaller as a result of dry weather in Colorado. New Jersey had a good late spring crop.

GREEN PEAS

Weedy fields caused by rainy May weather and drought conditions causing small pod development have brought the indicated production of the summer crop down 29 per cent from last year and 40 per cent lower than the 1949-51 average. In Colorado early peas did not recover completely from early frost damage and vines are stunted.

CELERY

An 11 per cent increase in summer supplies of celery over last year is reported, with production of 4,299,000 crates produced this summer. Prospective production for the six early summer states is 17 per cent above that for 1952. Production in the four late summer states, however, will be lower than last year.

VEGETABLES FOR PROCESSING

Acreage planted has remained the same or has increased for all crops except winter and spring spinach, cucumbers for pickles, and tomatoes, which have declined. The acreage of tomatoes is the smallest it has been since 1933.

The 1953 estimate of production for snap beans has increased 11 per cent over last year and 15 per cent above average, and the 455,030 tonnage in prospect for peas exceeds last year's production by 6 per cent.

IRRIGATION
Does all this for YOU

Quality, germination, and fertilizer efficiency can be improved with wise irrigation practices

By ROBERT L. CAROLUS
Michigan State College

IN THE arid West irrigation is a necessity and few vegetables are grown without benefit of six to 10 or more inches of irrigation water. In the more humid East the use of irrigation to supplement seasonal rainfall is expanding rapidly. The post-war development of lightweight portable aluminum pipe and the recognition of the insurance value of irrigation by growers of high value crops have contributed to this development.

The use of heavier machinery and inadequate conservation practices have reduced the waterholding capacity of many soils and helped to intensify the need for additional water for some crops on many soil types. Fifteen to 20 inches of water are required for most vegetable crops.

Late spring and summer rainfall, in addition to that which is already held in the soil, is generally adequate in most areas to meet crop needs. Soils range in the quantity of water they will hold from three-fourths to one inch per foot of depth in very sandy soil to two to two and one-half inches per foot in the heavier clay types, which explains the fact that crops on heavier soils "stand up" longer during drought periods than those grown on sandier soils.

Depth of rooting varies among crops and is an important factor in determining the necessity for irrigation. Strawberries, potatoes, sweet corn, and peas are shallow-rooted—18 to 26 inches—while tomatoes and beans are deep-rooted—four to six feet. Whether or not the crops reach their normal rooting depth will depend on such factors as soil type, soil compaction, and aeration.

The crop, soil type, soil structure, as well as rainfall, are all factors to be considered in determining the need for irrigation. During the early stages of growth crops require less water than they do at maturity, but a midsummer drought can be disastrous.

The value of sufficient irrigation to supply water to maintain plant processes that result in normal growth and yield during dry periods is well recognized. The prices received for a full crop, when drought has virtually eliminated non-irrigated crops, have frequently paid for irrigation installations in one season.

There are many advantages to be gained by the timely use of irrigation water that are not as obvious as an increase in yield, and many practices that can be used in conjunction with an irrigation system that under many conditions will pay extra dividends. By using a combination of the suggestions given below, it should be possible to obtain a fair return on the capital invested in a system plus the cost of operation every season.

For Improved Quality—

Irrigation can be used advantageously to:

1) Hasten maturity of green crops, carrots, beets, and cabbage, and increase the rate and uniformity of growth and thereby edible quality.

2) Increase the number and size of fruit per plant in tomatoes, melons, cucumbers, strawberries, and raspberries. Under mild drought conditions end of the season pickings of

these crops frequently consist of small-sized, second-grade produce.

3) Regulate the size of potato tubers. If dry weather prevails at time of tuber set, the number of tubers per hill will be low, and then if the weather turns wet as they mature, a small number of oversized tubers results. On the other hand, if the weather is wet at the time of tuber set, the number of tubers per hill will be large, and then if dry weather follows, the crop will consist mostly of No. 2 potatoes. Irrigating early to promote a good set and during maturity to insure their development will turn out large crops of well-sized tubers.

4) Prevent premature ripening and maturity with resultant poor quality of peas, sweet corn, and snap beans. Pod fill in peas, ear fill to the tip in sweet corn, and long straight pods in snap beans are associated with adequate soil moisture just previous to and during their bloom periods.

For Improved Germination—

5) Facilitate seeding during dry periods which on dry soils frequently result in unevenness of stand and slow germination in carrots, lettuce, spinach, and beans. Frequently it is impossible to obtain satisfactory stands of these crops from midsummer plantings unless the area is irrigated, preferably 24 to 36 hours before planting.

6) Soften soils that tend to crust, which will facilitate more even seedling emergence in beans, carrots, onions, and many other crops. A half-inch of water on soil that has been crusted due to heavy rains followed by rapid drying will many times prevent emerging beans from breaking their necks.

7) Facilitate the rapid, even germination of pelleted seed of lettuce, carrot, rutabaga, onion, and many other crops. Pelleted seed requires more surface soil moisture for germination than seed that is not pelleted. Growers with irrigation are in a better position to take advantage of the benefits to be derived from pelleted seed.

8) Prevent wind erosion of both mineral and muck soil from damaging or covering small emerging seedlings of onions, carrots, lettuce, and many other crops.

9) Allow raised bedding or ridging of early-planted warm-season crops in cold, wet soils, which subsequently might be injured due to the drying out of the ridge if not safeguarded by irrigation. This practice is particularly advantageous with lima beans, cucumbers, melons, and sweet corn.

10) Facilitate pre-emergence weed control practices by activating the chemical or by allowing it to penetrate deeper into the soil and also by promoting prompt weed seed germination which can be effectively eliminated by the chemical in such crops as onions, carrots, and spinach.

Long straight pods in snap beans are associated with adequate soil moisture just previous to and during bloom.

H. Armstrong Roberts

For Improved Fertilizer Efficiency—

11) Increase the efficiency of larger preplanting, side-dressing, and top-dressing fertilizer applications. Frequently it is unwise to apply an adequate quantity of fertilizer to "see the crop through" on sandy soils because of the danger of root injury if drought occurs. Irrigation will insure

(*Continued on page* 16)

Courtesy Champion Corporation

Water means life to these tomato plants at Vickers' Plant Farms in Mississippi.

"WE SAVED OUR CROPS!"

Here are true-to-life experiences of growers, one step away from disaster, who saved their crops with life-giving, man-made rain

IN 1952 and again this year, searing droughts have taken a tragic toll of crops and pastures. In the South oldtimers said last year was the driest they ever saw, and this year many have taken severe losses. Much of the Southwest was declared by President Eisenhower to be disaster area, and the usual summer trickle of the Rio Grande has dried up.

But fortunate have been the growers who provided their farms with water sources and irrigation. Their foresight has not only helped them to survive the drought, but it has let them flourish with good crops.

H. L. Vickers of Vickers' Plant Farms, Hattiesburg, Miss., used irrigation on his 35-acre field of corn when the corn began to curl and fire under the hot sun.

As a result the stalks grew nine feet high and carried heavy, well-filled ears. Some of the crop yielded 90 bushels per acre, and the average for the field was 80 bushels. Spots around the edges of the field that could not be reached by the sprinklers showed that the crop would have been a total loss without the water.

Vickers had installed a large centrifugal pump to force water from his ponds through eight-inch aluminum pipe which was laid in the field. Rubber couplings, which were sealed by the water pressure, helped make laying and picking up the pipe easy, and four sets of nozzles made it possible to water four acres at a time.

Vickers also found that in some cases he could raise two crops of high quality tomato plants in quick succession on the same acreage.

Another grower, Judge W. S. Catchings, also saved his corn crop at Hazelhurst, Miss. He made only one application of water at just the right time and got 87 bushels to the acre while neighboring farmers suffered complete crop failures.

Similar success was obtained with cabbage by A. T. Barron at Crystal Springs, Miss. He had struggled all his life to raise 10 tons of cabbage per acre. In 1949 he bought a small motor, a two and a half-inch pump, 400 feet of three-inch pipe, and six sprinklers. At the end of the season he harvested 14 tons of cabbage per acre. For this crop he received $139 a ton, or about $2,000 per acre.

After the cabbages were harvested, Barron planted corn which yielded 80 bushels per acre. He pumped water from a small creek which runs close to his fields.

At Alma, Ark., Frank Reed had considerable success with irrigation of beans. He sank a series of two-inch well points which together delivered 500 gallons per minute. With this system he used a regular high pressure centrifugal pump powered with a 60 h.p. motor.

When, in 1951, Reed's 15½ acres of green snap beans came into bloom at temperatures of 100° F., he irrigated them with one inch of water each week. He produced 70 tons of beans which brought him a gross income of $9,100, or an average of $587 per acre.

Courtesy Champion Corporation

Drought doesn't bother these five-week-old plants at the irrigated Vickers' Farms.

(*Continued on page* 17)

JUDGMENT . .

Is the Key to

SUCCESSFUL IRRIGATION

Soil, weather, and growth habits are factors in whether or not to invest in irrigation

By ELDON S. BANTA

THE fundamental principle in irrigation is to supply water to the roots of plants when needed. In arid regions it means providing practically all the water, whereas in humid regions it means merely supplementing rainfall with enough water to satisfy crop needs.

Practical irrigation involves the study and application of many sciences. A knowledge of growing and rooting habits of the crops themselves is important, for some crops require more water than others because of different growth characteristics.

The University of California classifies vegetable crops according to whether they are deep-, moderate-, or shallow-rooted in California soils, and a list of these appears on this page.

Shallow-rooted crops, such as onions, potatoes, lettuce, and sweet corn, do not develop extensive root systems and require more frequent irrigations than do deeper rooted crops. This is because the roots do not have as large a water storage area to draw from as do deep roots.

This indicates that deep-rooted crops such as tomatoes and asparagus can withstand longer drought periods than shallow-rooted crops. However, they require heavier water applications in order to reach deeper to a greater number of roots feeding the plant.

If you could know the transpiration rate (evaporation of water from leaves) of a given vegetable crop, it would be helpful in determining the frequency of irrigation. But this factor varies greatly and could be approximated only by measuring the daily temperatures, wind movement, humidity, and hours of sunshine. Each crop differs in its transpiration rate.

In this connection, not only must the transpiration rate of the plants themselves be considered, but also the rate of evaporation of water from the soil.

It is generally considered that almost any crop that nearly covers the ground by July will use from 10 to 15 inches of water during July and August. In many sections of the East the normal rainfall for these two months is about half this amount. So the need for irrigation at this time is apparent.

When crops are growing rapidly and adding weight, they will evaporate from 300 to 1,000 pounds of water for each pound of dry matter produced. Thus, if an acre of cabbage were increasing yield at the rate of a half-ton daily, the water requirements could be from two to five acre-inches of water per day, depending upon the many weather factors.

Another period when moisture is very important in the life of a plant is just after germination. Crops

ROOTING DEPTH OF VEGETABLES

Following is a list of vegetables which are classified according to their rooting depths in California soils. The list is prepared by the University of California.

Shallow-rooted (down to 2 feet)	Moderately deep-rooted (down to 4 feet)	Deep-rooted (down to 6 feet)
Brussels sprouts	Beans, pole	Artichokes
Cabbage	Beans, snap	Asparagus
Cauliflower	Beets	Cantaloupe
Celery	Carrots	Lima beans
Lettuce	Chard	Parsnips
Onions	Cucumbers	Pumpkins
Potatoes	Eggplant	Squash, winter
Radishes	Peas	Sweet potatoes
Spinach	Peppers	Tomatoes
Sprouting broccoli	Squash, summer	Watermelons
Sweet corn	Turnips	

From a quality standpoint vegetables grown under irrigation are tastier and richer in food value.

W. B. Camp, extensive grower of vegetables and fruits in the rainbelt state of South Carolina and in arid California, through years of experience has learned successful irrigation techniques. He has this to say about the irrigation of vegetables:

"In the majority of the vegetable growing areas, irrigation of some type is inevitable. We are constantly attempting to increase our production per acre, raise the quality of the crop grown, and at the same time lower our per unit cost. The best ways to do this on many thousands of acres of cropland is by sprinkler irrigation coupled with an adequate supply of plant food. Farmers the country over have seen their crops that were planted, cultivated, and fertilized to the best of their ability, perish prior to the time of maturity because of the lack of rainfall.

"The cost of seed bed preparation, planting, fertilizing, etc., is now much higher than just a few years ago. We should expect a higher net return per acre in order to realize a fair return on the investment. In order to do this and at the same time insure the crop against a complete drought, irrigation and increased use of fertilizers is of tremendous importance."

seeded in the summer for fall harvest frequently need irrigation to get them off to a good start. This means bigger yields in the fall. The amount of water needed at this time is much smaller than later, when plants nearly cover the soil. Applications are usually more frequent but need not be so heavy.

From a quality standpoint, vegetables grown under irrigation are tastier and richer in food value. Leafy vegetables are crisper and more tender when grown rapidly with lots of water. Some crops respond to irrigation in dry periods by having less rotting and spoilage of fruit or foliage. Tomatoes will have less blossom-end rot. On the other hand, some leafy vegetables may develop foliage diseases if kept wet too long.

Sprinkling during the heat of the day is important with such crops. Amount of rainfall or irrigation water during the blossoming period often affects fruit setting on many vegetables, and so affects yields. For example, lima beans do not set heavily if either too dry or too wet at blossomtime. If water application at this time can be controlled, maximum yields are more certain.

Thus, a thorough knowledge of each vegetable crop will help determine when to irrigate and about how much water to apply each time.

If you know the type of soil, depth of top soil, nature of the subsoil, organic content, and the amount of air space in the soil, you are in a better position to determine the frequency and amount of irrigation needed for a given crop. Such knowledge is particularly helpful in determining how much water to apply at a given setting.

Heavy clay soils seal over quickly and water penetrates them slowly, often less than .05 of an inch per hour. Such soils are better sprinkled with a fine "rain."

Once the surface is sealed with fine clay particles, the remainder of the water runs off. A light cultivation will make the surface more receptive to water.

Such heavy soils can be improved through the application of manure and the plowing under of green manure crops. This increases the organic content of the soil and thus prevents such rapid sealing over.

Building up the organic content of a soil also aids in increasing the rapidity of water penetration into the lower soil areas. The faster water can get down into the root zone, the quicker and more efficiently it can be used by the crop. Also, if water goes down rather rapidly and easily, so will the roots of the crop.

Sandy and loam soils allow more rapid water infiltration than do heavy clay soils. However, a sandy soil may have a hardpan, or layer of nearly impervious clay, a short distance under the surface. This will slow the rate at which water enters the deeper root zone.

At the North Appalachian Experimental Watershed near Coshocton, Ohio, much useful information has been accumulated about soil and water relations. Scientists there have

(*Continued on page* 20)

On the D. W. Henning Farms in the Salinas Valley of California harvesting and packing lettuce are done in the field and the dry-packed lettuce is then vacuum cooled. Henning has two of these time- and labor-saving assembly-line machines.

REVOLUTION In the Salad Bowl

Grower-shipper initiative plus new assembly-line methods battle for survival in California's Salinas Valley

By F. HAL HIGGINS

BANKRUPTCY and hard times are threatening the Salinas Valley in California, but today a tossed salad is mixing in the Salad Bowl. No industry is doing a more serious, thorough, well financed job to hold its place and insure its future with the American consumer than is the Salinas vegetable industry.

The price of lettuce is down, but the grower-shipper is not asking for government "supports," increased tariffs against anyone, or planning to fold his business and retire. He's fighting his way out via new ideas and lots of well planned research to develop new and better varieties, higher quality fresh vegetables in more efficient and attractive packages, machines to re-equip his skilled labor for more output per man per hour, and new byproducts of high market value from his waste packing house trimmings.

Above all, he is not willing to stand pat. He is looking for men with new and daring ideas that will strike at the heart of his problems.

"We are in one of those critical spots of the industry that calls for finding men with big practical ideas for hitting our targets," said one key grower as he summed up the situation.

That the battle of lettuce to survive as the dominant factor in Salinas Valley prosperity is the overshadowing topic of everybody from labor to capital was noted by this writer on his recent visit to the valley.

Nearly half the lettuce is being dry-packed in the field and cooled by steam in vacuum cooling plants instead of by ice, and the deep "feather bedding" is being yanked out of the overtime packing shed labor end of the business.

The daily vegetable market report piled on the hotel register desk showed the score of ice-packed vs. dry-packed lettuce shipped, to prove that more than 42 per cent of the crop was being packed without ice by the crews in the field instead of by the bigger crews using ice in the sheds.

What is this dry-pack method that is tossing up the Salad Bowl? It is a picking-packing-cooling system that eliminates 30 pounds of ice per standard lettuce crate. It does away with bruising, ice burning, and discoloration of lettuce heads, and eliminates the use of water that causes supersaturation and encourages bacterial slime and mold.

Together with the new packing method, the revolutionary use of fiberboard cartons instead of wood for packing lettuce is developing.

These innovations are helping the lettuce growers to stand on their own financial feet without begging handouts from Uncle Sam.

With the dry-pack method the lettuce is packed in the field as it is cut, thereby eliminating shed trimming and ice packing operations. Once packed, the lettuce is taken to the vacuum cooling plant where it is chilled to 30° to 34° in a few minutes.

The vacuum cooling process is one in which the field-packed lettuce is loaded into airtight tubes. By applying steam pressure, a vacuum is created which draws the heat from the lettuce, evaporates surface moisture, and evenly reduces its temperature inside and out. When cooled it is ready for shipping by rail with only bunker icing.

The whole procedure from dry-packing in the field through cooling can be accomplished in one to one and one-half hours instead of the 12 to 72 hours that were formerly required.

An offshoot of the dry-pack method is that a new type of labor picture is developing. American laborers who formerly worked in a standing position in the packing sheds are refusing to go into the fields to the stooping work in the heat of the sun.

One grower said, "We pay Mexican Nationals top wages, even above the union scale. Most of them get 85 cents an hour, but with overtime disappearing there is considerable step-down in weekly take-home pay. Only the Mexican seems to fit and like the work."

This grower does his work with crews of 30 to 35 men moving along with the trucks and packing machine.

Of course to accomplish the revolution has taken the mobilization of the

best brains to be found in agricultural science, backed by plenty of money and on-target management. Salinas County has done it by building up its own 25-acre grower-shipper experiment station at the edge of Salinas.

For more than a decade the growers had felt the need of local vegetable research, Secretary-Manager Jack Bias of the Grower-Shipper Vegetable Association said.

Other areas had also discussed and thought along the same line, especially in the Imperial Valley on the Mexican border where soils and climate differ so greatly from the rest of the state. Finally, about 20 years ago, the Meloland Experiment Station was organized. It is now being expanded into a small agricultural college for education of the farm lads in that hothouse area.

For 20 years the grower-shipper association, working with such leaders as J. E. Knott, professor of vegetable crops and plant physiologist at the experiment station, and A. A. Tavernetti, county advisor for Monterey County, has built up a research fund from fees for inspection service on lettuce and carrots.

As a result of this know-how, the Salinas Valley, with its coastal Watsonville appendage of the Pajaro Valley, grows about half of the nation's iceberg lettuce in a fog-kissed area of about 130 by 15 to 30 miles. About 60,000 carloads of vegetables are shipped out annually in a year-around farming system that results in five crops in two years in some cases. Two-thirds of this crop export is lettuce.

The lettuce growers are solving their own problems in the best tradition of initiative and know-how. By means of adopting modern "assembly-line" methods to the lettuce and vegetable industry, they are truly creating a revolution in the Salad Bowl. THE END

Tom Kennedy

Parnell Studio

Trainload of lettuce going into vacuum cooler for 20-minute cooling treatment.

Left—A full load of lettuce dry-packed in fiberboard containers goes from truck to cooler via this giant fork-lift truck.

Stepick's Studio

Box-forming unit mounted on truck and powered by auxiliary engine at rear of truck is another method being used in the Salinas Valley lettuce fields to cut costs. Boxes are tossed off as harvest proceeds across the lettuce field.

Cooled lettuce is removed after 20 minutes in the vacuum cooling tubes at Gonzales, Calif. It had been dry-packed in the field previous to cooling.

VACUUM COOLING Saves Time and Money

By D. H. DEWEY
Michigan State College

Lettuce and leafy vegetables are especially adaptable to this efficient cooling method

THE tremendous success in cooling lettuce by vacuum on the West Coast has created a lot of interest in this "new" method of precooling produce for shipment and marketing. It is not really a new process because the principle has been known for many years. Actually, it is merely a new application of cooling by evaporation in which water loss is encouraged and speeded by reducing the atmospheric pressure surrounding the produce to be cooled.

We all know that water boils at 212° F. at normal atmospheric pressure and that when the pressure is decreased, the boiling point is lowered. Most of us have had first-hand experience with this when our automobile radiators boiled over unexpectedly on a high mountain.

In order to boil water at 32° F., the normal atmospheric pressure of 29.92 inches of mercury must be reduced to 0.18 inches, or in other words, we must draw a vacuum of 29.74 inches. Evaporation is a cooling process and consequently we can remove the heat from the lettuce by encouraging the water to evaporate in a vacuum chamber.

The leafy vegetables can be quickly cooled by vacuum because they present a large surface area for the evaporation of water. Spinach, prepared salad and soup mixes, and head lettuce are commercially precooled this way, but head lettuce is the only one now handled in volume. It was recently estimated that 40 per cent of the lettuce shipped by rail from California and Arizona is vacuum cooled, and the market acceptance of this lettuce is good.

The receivers like it because it arrives in good condition without the messiness of package-icing and top-icing. It is dry, but not excessively wilted, and is frequently free of the broken midribs and bruised exterior leaves that sometimes occur with the ice-pack. Together with these advantages, a large quantity of the vacuum-cooled lettuce is shipped in fiberboard containers that are smaller and easier to handle than the regular four-dozen size wooden crates.

The growers and shippers enjoy advantages from vacuum cooling. The lettuce may be field packed at considerable savings in labor cost, and the fiberboard boxes provide a cheaper container than the wooden crates. It is also reported that the cooling charges are less than the costs of package-icing and top-icing.

Knowing that a small water loss from head lettuce and other leafy vegetables is extremely detrimental

(*Continued on page* 19)

STATE NEWS

• Keystone Growers Enjoy Busy Meet at Potato City
• Survey Points Way to Brighter Future for Maine Potato Growers

PENNSYLVANIA—An enjoyable and busy program occupied growers at the Field Days of the Pennsylvania Co-operative Potato Growers. Held in July at Potato City, high up in Allegheny State Forest, the affair was a testimonial to the enthusiasm of Pennsylvania growers and to the vision of their leaders.

Potato City is a 400-acre experimental farm with a modern hotel of 38 rooms and a dining hall which seats 500. Growers bought shares at $500 and $100 apiece to finance the building of Potato City.

Ivan Miller of Corry, one of the state's largest growers, demonstrated to Field Day visitors his system of planting and growing potatoes. Miller plants over 400 acres to potatoes and enjoys yields of 500 to 600 bushels per acre. He places emphasis on land preparation, striving for a rather trashy, cloddy soil which absorbs water readily and prevents hardening of the surface with consequent run-off and poor sprouting. Tools demonstrated included disc, plow, planter, cultivator, weeder, sprayer, digger, and harvester.

How to construct a terrace was demonstrated, and growers also toured Dr. E. L. Nixon's potato breeding plots. On the second day, Pennsylvania's 1953-54 potato blossom queen was chosen.

MINNESOTA—Despite much moisture crops look good. Hail has damaged potatoes, onions, and beets in some areas. Onion maggot has reduced stands also. A good harvest season is still anticipated.

Hollandale was host to the 7th annual tour of the Southern Minnesota Vegetable Growers on July 16. The 400 people who attended saw potato and cabbage variety plots, weed control plots, and spraying equipment and demonstrations.

A large potato exhibit will be a feature of the Minnesota State Fair August 29-September 7. Featured will be a booth selling French fried potatoes from Minnesota Kennebec potatoes.—*Orrin C. Turnquist, Sec'y, Minn. Veg. Growers Assn., St. Paul.*

MAINE—Hot potato, hot potato! Yes, the problems of the Maine potato industry have been hot ones, and they have been passed around for a long time, but now the industry itself has done something concrete to overcome the situation by instigating a survey. Newsome & Co., Boston, industrial engineers, have made the survey and have returned some answers for relieving last May's situation of prices: 45 cents a bushel for Maine potatoes as against $1.50 in Idaho, $1.40 in Colorado, and $1.30 in Florida.

They say that Maine growers must stop shipping potatoes that they themselves would not buy and they must start marking containers so the potatoes can be traced to their sources. They also urge Maine to unify its effort and build strong trade associations. They say that she must increase her potato tax for industry promotion, cut down on number of varieties, and improve and enforce grading laws. A grievance committee should also be established to investigate reports of shady practices to help keep the whole industry in line.

George Tallman, new general manager of Pennsylvania Co-operative Potato Growers Association (left) and Ivan Miller, first vice-president, at the recent Potato Field Day held at Potato City, Pa.

In line with this survey, Maine has already tightened its grading laws and has reduced the number of varieties shipped under the state trademark to Katahdin, Green Mountain, and Kennebec. They have also created the new grade of "Maine Medium Potatoes" and changed the requirements for the widely known "Chef's Special" in order to insure more uniform quality of state trademark potatoes.

OREGON—Commercial bean and corn crops will be late, with picking coming not far along before school opens; thus, the labor situation will not be too good. Commercial and home gardening are late this year because of rain and cool weather which caused a late spring. Corn and bean fields had to be replanted.—*R. Ralph Clark, Ext. Serv., Corvallis.*

MARYLAND—A Vegetable Field Day will be held for vegetable growers from 2:00 to 5:00 P.M., Saturday, August 22, at Salisbury. The program will take place at the University of Maryland Vegetable Research Farm, two miles west of town on the Quantico Road. Dr. Victor R. Boswell, head of the Division of Vegetable Crops and Diseases, USDA Bureau of Plant Industry, will speak.

CALIFORNIA—Ninety to 95 per cent control of corn earworms has been found possible after two or three applications of five per cent DDT dust to the corn silks by means of a stencil or shaving brush. Kern County sweet corn producers who have tried the procedure in which each silk is treated as soon as it emerges on the husk, are well satisfied with the results of developments to date.—*David N. Wright, Farm Advisor, Bakersfield.*

NEW YORK—Rural Radio Network, a unique 13-station FM radio network which is completely farm sponsored and which serves New York farmers with farm reports, news, and entertainment, celebrated its fifth birthday recently. The New York State Vegetable Growers Association is among the 10 leading farm organizations which sponsor the network. This is said to be the only farmer-owned statewide broadcasting system in the country.—*William B. Giddings, Sec'y, New York State Vegetable Growers Assn., Baldwinsville.*

FLORIDA—The largest watermelon crop on record has just been shipped. About 90,000 acres were grown, and approximately 14,800 truck loads and 12,204 rail carloads were shipped.

Joffre C. David, general manager of the Florida Fruit and Vegetable Association, will assume the duties of executive vice-president of that organization. He fills the place of LaMonte Graw, who resigned the position recently.—*George M. Talbott, FFVA, Orlando.*

MISSOURI—Irish potato production will be very low and the tomato crop is expected to be short unless more rain can save the day. Missouri droughts have limited prospects for fall harvests.—*Clyde R. Cunningham, Extension Serv., Columbia.*

MICHIGAN—Growers from Michigan and Ontario, Canada, swapped visits recently. The Harrow Experiment Station was the first stop for 105 Michigan growers on their tour of the Leamington-Kingsville area in Essex County, Ontario. There, Les Ounsworth, vegetable specialist, showed the group the tomato trials and the results of several years' work in developing a cantaloupe with all of the Canadian market qualifications.

Farm visits of this tour included the farm of Ralph A. Wright, president of the Essex County Associated Growers, the Ellison Bell Farm, John Reynolds Oak Farms, Ltd., Clare Wilkinson's potato operation, and Albert Bruner's fruit and vegetable farm.

Forty Canadian growers from Kent County reciprocated with a visit to Michigan, where they visited the Jack Kelly onion farm at Parma and the George Farley place at Albion.—*J. W. Rose, Ext. Hort., East Lansing.*

Maximum **YIELD** *Top—* **QUALITY** *...with a* **MOULTON Portable... IRRIGATION System**

The Moulton Portable Irrigation System is the modern farmer's insurance against crop failure. It is adaptable to any size or shape of field where water is available!

- **Lightweight aluminum portable construction.**
- **No Bolts or rivets—welded**
- **Design allows 25 degrees flexibility**
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- **Coupled or uncoupled in one operation.**

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Write for folder answering your irrigation problems. Give the name of your nearest Dealer.

IRRIGATION DOES THIS FOR YOU!

(*Continued from page* 8)

the usefulness and profitableness of larger fertilizer applications.

12) Apply additional fertilizer in water through the irrigation system, or to wash off a top-dressing application and insure its immediate effectiveness. Fertilizer applied through the irrigation system will not be as evenly distributed as when it is applied by other methods because of the variation in the water distribution pattern. However, many soluble nitrogen and potash materials have been very effectively applied by this method.

13) Reduce injury on heavily fertilized soils from accumulations of soluble salts which are brought to the surface by evaporation and are concentrated near plant roots during drought periods. This is a very important benefit from the use of irrigation on sandy soils.

Other Dividends—

14) Help reduce aphis, thrip, and other insect populations on tomatoes, potatoes, onions, melons, and cucumbers. Insect populations build up during dry periods and frequently can be held in check by drenchings with irrigation water.

15) Prevent frost damage (irrigate dry soils 12 to 24 hours previous to low temperature period) by maintaining air temperature near the soil level at a temperature 3° to 5° F. higher than the temperature over a dry soil.

16) Prevent frost damage by operating sprinklers during the low temperature period (5° to 7° F. protection). This practice has been particularly effective with strawberries and tomatoes.

17) Aid in promoting recovery from transplanting with tomatoes, cauliflower, cabbage, and many other crops by irrigating 24 to 36 hours before setting the plants to the field.

18) Produce heavier summer green manure crops that frequently must be seeded on dry soil following the harvest of a spring-planted vegetable crop.

19) Facilitate plowing dry soils or in breaking up cloddy or lumpy soils that had been plowed when they were too wet.

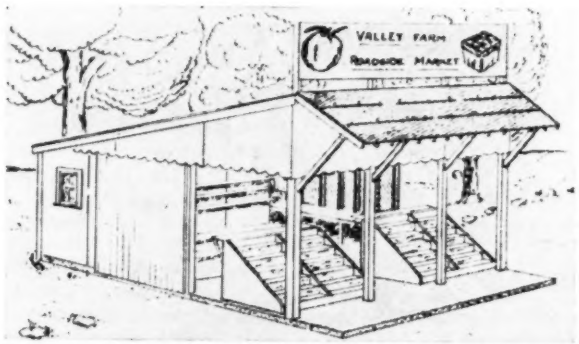
20) Facilitate the successful production of high quality non-drought resistant-varieties. Varieties of many crops that produce high yields of good quality under adequate moisture are not tolerant of drought conditions.

21) Facilitate the production of a wider variety of crops during a longer season and more double or succession cropping.

22) Improve the overall quality and yield of crops grown to such an extent that labor will be better satisfied with piecework harvesting.

From the above list of possible extra dividends that in certain situations may be derived from the use of irrigation it might be deduced that irrigation is a panacea. This is not the case. Crops may be easily over-irrigated with a resultant loss of nutrients, development of poor soil aeration, or shallow rooting. Soil compaction and the breakdown of soil structure are promoted by continuous irrigation of fields with little foliage cover that are low in organic matter.

The maintenance of adequate organic matter and the practice of soil conservation become imperative for the irrigator. Frequently growers, due to the labor involved in setting up their equipment, delay an initial irrigation too long. Don't wait until crops show symptoms of drought injury before irrigating. THE END



The motoring public has taken to the road in droves. Whether in California or Maine the consumer will be attracted to well arranged displays of freshly picked vegetables. The roadside market illustrated, conveniently located so the motorist can readily stop, will make it easy for you to take care of customers quickly. Working drawings for this easy-to-build stand are available for 50 cents from AMERICAN VEGETABLE GROWER, Willoughby, Ohio.

"WE SAVED OUR CROPS"

(*Continued from page* 9)

Last July, with his previous success in mind, Reed planted 19 acres of beans. The land was so dry that it had to be irrigated before plowing, and five times after planting. Each irrigation cost him $2 an acre to provide one and one-half inches of water. After the beans were five inches high, he watered every fifth day. Despite damage caused by an extremely early frost, he again harvested 70 tons of beans, this time selling them for nine and three-quarter cents a pound.

In August, Reed planted 11 more acres of beans and managed to hold off damage of three killing frosts by icing them down with his irrigation system. Although this crop was finally killed off by a hard freeze, he managed to get 18 tons of beans from it. Thus, from his total 30 acres of beans, he grossed approximately $17,000.

Reed also managed to grow 41 tons of spinach on 13 acres. He got $150 a ton for this crop.

Thus, it is plain that many farmers have found that irrigation pays off. Of course it has its disadvantages, too. One of the most formidable is the need for an adequate supply of water. Many growers find that digging their own ponds works right in with their state erosion prevention programs, and the ponds can also serve as watering places for animals.

Some farmers have found it worthwhile to make temporary brush or dirt dams across small streams on their property, while others find it necessary to dig deep wells. In any case, where water is available, irrigation, plus a sense of timing, has been found to be practical, and overhead systems are well adapted for light, sandy loams. Irrigation can spell the difference between burned up fields and bumper crops. THE END

PLANET JR. PRESIDENT DIES

MATTHEW J. SCAMMELL, president of S. L. Allen & Co., Inc., Philadelphia, manufacturer of Planet Jr. tractors and farm and garden equipment and also Flexible Flyer sleds and skis, died recently.

Mr. Scammell purchased an interest in Planet Jr. in 1929, at which time he became president of the firm and immediately started to direct his efforts toward the development of the garden tractor and attachments.

with RAIN BIRD Sprinklers

Forecast local showers when you want them, where you want them, with Rain Bird Sprinklers. They're engineered to provide even distribution of water at less cost, less labor, and are famous the world 'round for their faultless operation.

To stop erosion and for higher crop yield, let Rain Bird solve your irrigation problems.

Our research and planning department is at your service. Write today without obligation.

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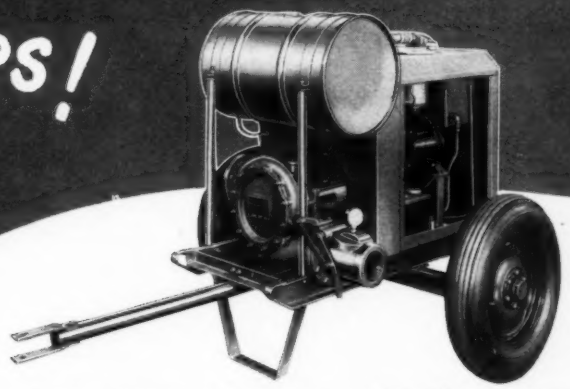
Read the advertisements and remember advertisers will be glad to send you catalogs, specifications, and prices. Be sure to say you saw it in AMERICAN VEGETABLE GROWER.

"JEEP" Engine Driven IRRIGATION PUMPS for ALL CROPS!

Gorman-Rupp pumps assure adequate water for this orchard.

Sufficient water supply for irrigation, as pictured below, results in a larger and better quality crop of potatoes.



More and more farmers and growers are depending on Gorman-Rupp centrifugal irrigation pumps to assure a good crop.

The "Jeep" engine driven unit combines the famous "Jeep" engine performance with Gorman-Rupp well-known pump efficiency and dependability.

Heat exchanger cooling makes 5% more of engine H.P. available for pumping. Excellent performance from 250 g.p.m. at 120 pounds to 600 g.p.m. at 55 pounds. Serves both high pressure and medium pressure systems. Thirty gallon fuel tank.

When you sell a farmer a Gorman-Rupp pump you can be sure of his satisfaction. He gets *better performance* at a *lower operating cost* than any irrigation pump built. *Ask for Bulletin 2-IR-11-JX*

GORMAN-RUPP ORIGINATES — OTHERS IMITATE

GORMAN-RUPP PUMPS

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NEW FOR YOU

—to increase your profits

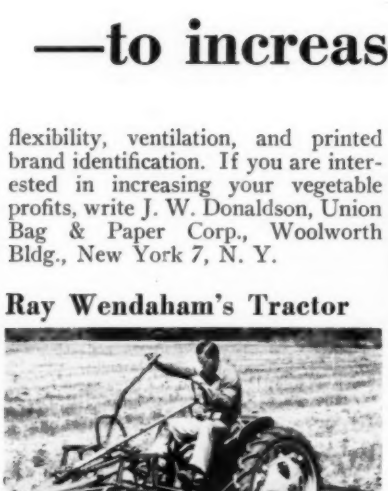
Your Man Friday

The other day we called on a vegetable grower in northwestern Ohio who has made his equipment pay for itself. One laborsaving piece of equipment he has is the Roto-Hoe which he has used for two seasons. Recently he purchased a new sprayer to fit his Roto-Hoe. Now his equipment does two jobs at little additional cost. The new Roto-Hoe sprayer, called Roto-Zephyr, delivers pressures up to 150 pounds and is ideal for many small spraying jobs. The unit costs only $77. If you would like full particulars, write Howard Ober, President, Roto-Hoe & Sprayer Company, Newbury, Ohio.

Bag Profits

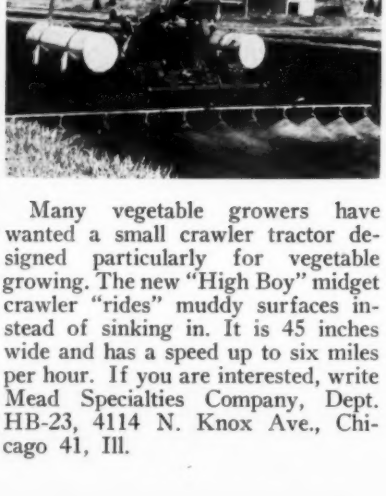
Virgil Sprinkle, a large onion grower in Homestead, Fla., tells us he has had success with the new "King Size" mesh window bag. This new bag holds 50 pounds of onions and provides the grower with all the features of profitable and proper vegetable packaging. The new bag allows flexibility, ventilation, and printed brand identification. If you are interested in increasing your vegetable profits, write J. W. Donaldson, Union Bag & Paper Corp., Woolworth Bldg., New York 7, N. Y.

Ray Wendaham's Tractor



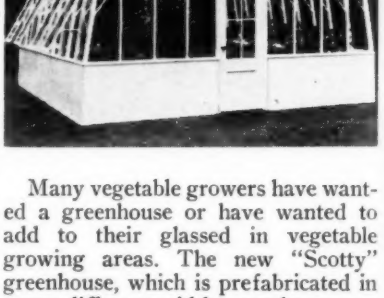
Not long ago we saw Ray Wendaham, who operates an extensive truck farm near Live Oak, Fla. We were particularly impressed with his commercial watermelon acreage and the new Allis-Chalmers Model G tractor which cultivates crops with 20-inch sweeps and 14-inch disc tillers mounted front and rear. Allis-Chalmers specializes in making tractors and tools for every job, and if you would like more information on how you can cut costs write Carl F. Meyer, Allis-Chalmers Manufacturing Company, Tractor Div., Milwaukee, Wis.

Small Crawler



Many vegetable growers have wanted a small crawler tractor designed particularly for vegetable growing. The new "High Boy" midget crawler "rides" muddy surfaces instead of sinking in. It is 45 inches wide and has a speed up to six miles per hour. If you are interested, write Mead Specialties Company, Dept. HB-23, 4114 N. Knox Ave., Chicago 41, Ill.

Prefabricated Greenhouse



Many vegetable growers have wanted a greenhouse or have wanted to add to their glassed in vegetable growing areas. The new "Scotty" greenhouse, which is prefabricated in many different widths, can be assembled by anyone. Several sections can be put together giving the grower any size house he may need. Roof and side ventilation are provided and all materials are the best available. This new greenhouse is ideally suited for plant propagation and roadside display. By erecting the greenhouse yourself, as much as 10 to 15 per cent can be saved on labor. Why not write Ernest Chabot, Lord & Burnham, Irvington-on-Hudson, N. Y.?

It's Easy

Not long ago one of our editors saw the new Supplex flexible sprinkler being used in a commercial vegetable growing operation. Supplex flexible sprinklers can be moved easily from one setting to another, and because they are ruggedly made from the finest materials they last indefinitely. Write Al Kaufman, Industrial Synthetics Corporation, 225 North Ave., Garwood, N. J., for full information.

VACUUM COOLING

(*Continued from page* 14)

from a quality standpoint, it seems almost fantastic that we can actually cool these crops satisfactorily by evaporating away some of their moisture. The losses during vacuum cooling amount to two to three per cent of the original fresh weight of the heads and losses of this size usually mean excessive wilting of outer leaves.

This is not the case with vacuum cooling since the water is taken from all parts of the head, with the inner leaves losing as much water as the outer leaves. The water losses are so well distributed that no one part of the head is markedly wilted. This phenomenon accounts for the rapid cooling that takes place throughout the heads and throughout the packed crates or boxes almost simultaneously.

The non-leafy vegetables are not well suited to vacuum cooling because they cannot give up enough water rapidly for the cooling process, even though many of them are considered to be highly susceptible to wilting because of water loss.

Such crops as asparagus, broccoli, sweet corn, and celery have been experimentally cooled by vacuum, but their cooling rates seem to be too slow for practical purposes. The vegetables which have not been satisfactorily cooled under vacuum include tomatoes, cucumbers, snap beans, and topped carrots.

Vacuum cooling would appear to be ideally suited to the summer production areas. Head lettuce produced in these areas is primarily field packed and precooling by contact icing and air circulation is not very practical. The field heat of the packed lettuce could be readily removed by vacuum methods, but unfortunately, the small volume and short harvest seasons do not presently justify the construction and operation of cooling plants.

Equipment Cost

It is estimated that the average vacuum cooling plant now in operation for lettuce costs more than $200,000. Smaller and less expensive units seem feasible, but a harvest season extending over three to four months would still be required for economical operation.

There are several possible ways whereby vacuum cooling might be made available to growers and shippers outside of the large lettuce areas in Arizona and California. One would be to devise portable units which could be moved from one area to another according to the precooling needs. A second is the adaptation of vacuum facilities to other uses to help underwrite the original investment in equipment. THE END

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Willoughby, Ohio

KEY TO IRRIGATION

(*Continued from page* 11)

found that water will enter the top seven inches of a silt loam soil at the rate of six inches per hour. However, the subsoil below acts as a bottleneck, for it will permit water to go through at the rate of only one-quarter to one-half inch per hour, depending upon its clay content.

The seven inches of topsoil contain about 30 per cent air space, which can be filled with irrigation water. Thus, 30 per cent of seven inches is roughly two inches, the amount of water this topsoil can hold.

If you are sprinkling crops on such a soil, you can expect to irrigate for about two hours at a setting if one inch per hour is applied. If erosion has taken place and the subsoil is now the cultivated soil, you can readily see that the amount of water it can take before runoff occurs is considerably less. Under irrigation it is important to maintain a soil with good structure.

As shown previously, the air space in the soil is the amount of space that can be filled with water during irrigation periods. Of course, shortly after watering, the excess water drains into the subsoil and is taken up by plant roots, or it evaporates from the soil surface. The water remaining in the small capillary pores is the amount that the crop roots have to drink from until the next watering.

Agronomists characterize the point at which all the excess water in the air space has drained out and only the capillary water remains as "field capacity" of the soil. When all the remaining capillary water is used and plants wilt, they call this the "permanent wilting point." Unless more water is added, plants die. It has been determined from several sources that plants apparently have no optimum water requirements. They can grow and use water anywhere between field capacity and permanent wilting.

When to Irrigate

It is obvious by now that planning an irrigation program solely on the soil moisture content is inadequate and that it is the frequency of rain periods rather than the total amount of rain that makes the big difference whether to irrigate or not.

If we refer to a previous statement that many crops use up to 10 to 15 inches of water per acre during July and August and that only about half this amount falls as rain during this period, we see that irrigation is pretty essential to big, profitable yields.

Here are some questions which will help you to decide whether to irrigate

or not: How much did it rain yesterday? How much water ran off, if any? What is the water storage capacity of the rooting zone of the crop? Did it get filled up? How much of it is available to the plants? How long will it last the crop at present temperatures and plant growing rates?

If you can come to the conclusion that practically all the water that fell and is available to the plant roots is going to be used up by noon tomorrow, then you probably should begin your sprinkling shortly after that.

Does Irrigation Pay?

In summing up any discussion of irrigation, the prime question is, "Does irrigation increase yields sufficiently to offset the cost of the practice?" There is one indirect answer: There are practically no vegetable growers who use properly installed irrigation equipment who have sold such equipment and gone back to depending only on rainfall. In fact, the practice is expanding constantly in every area where vegetables are grown.

Last year, Frank Foard, a large vegetable grower of Baltimore County, Maryland, started irrigation on turnip tops. Three applications increased yields a ton per acre, or $40 worth per acre. This year he is planning to irrigate 100 acres of tomatoes and 350 acres of snap beans. An almost unlimited supply of water is needed to carry on a project of this size.

Alabama vegetable research workers for the last 10 years have been trying to find out if irrigation is profitable on a number of crops grown in that state. Considering all costs, they find that it takes about $5.50 to put on an acre-inch of water. In their tests about five inches per crop were applied.

They also compared fertility treatments with irrigation on several different crops. Some were spring, others summer, and the remainder fall vegetable crops. Irrigation paid greater dividends on spring and fall crops than on summer crops.

The standard organic treatment consisted of two tons per acre of dry lespedeza sericea in winter and six tons of green crotolaria in summer. Fall crops without the organic matter returned $67.22 per acre while those receiving the organic material returned $125.55 above the cost of irrigation. Spring crops made $6.25 per acre above costs without, and $75.81 with organic matter. Summer crops made $16.78 without, and $36.28 with organic matter above irrigation costs. THE END

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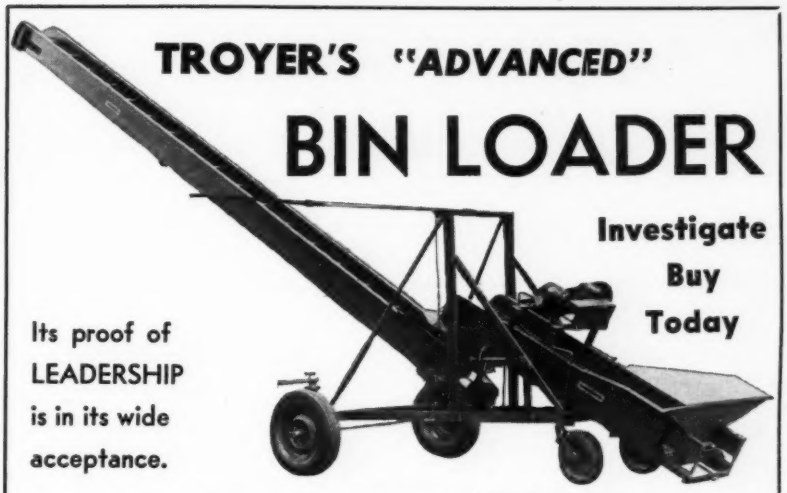

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Going to Change Crops?

THERE may be times when a grower must change from one vegetable crop to another. How does he select the new crop? Many factors are fundamental for a wise decision. Expected yield, pests that may attack the crop, labor required, and marketability of the crop are among them.

The University of California makes frequent and useful studies of the vegetable industry in its state, and many of these studies could or should be duplicated in other states. For instance, California has figured out that an average of 234 pounds of winter squash can be produced per man-hour of labor, which is more than for any other crop. At the bottom of the list is snap beans, of which a man-hour of labor can produce only 16 pounds. Potatoes rank next to the top with 150 pounds per man-hour.

A study of these figures for certain crops brings up some interesting questions. What job requires the most labor? Can it be mechanized? For instance, with the snap beans, when the mechanical harvester is perfected, from a fourth to a half of the labor requirement for this crop will be eliminated.

We must keep looking for changes which will make each of our vegetable growing businesses a little more efficient or a little more attractive to those operating them.

Are Droughts Becoming More Frequent?

A MAN who had been growing vegetables for over 45 years recently asked us the above question. He felt that his crops were not a great deal better than they were 40 years ago before he had irrigation. Still when he looked across the road at the crops of his neighbors who were irrigating, he was sure that the additional water was beneficial.

Some people claim that lumbering and land-clearing operations have removed the source of some of our rainfall. The Weather Bureau's long-time records, however, indicate that on the average of a five or 10-year period, present-day rainfall is just about equal to that of 50 years ago.

Very likely irrigation in the East might have been profitable 50 years ago, but we are sure it is even more profitable today. The almost complete disappearance of the horse on vegetable farms has had considerable effect on the quantity of water held in the soil and on the ability of plants to root deeply enough to utilize it. Rotation of barnyard pastures and production of some hay after crops of oats were desirable soil conservation practices. The use of the manure produced on light or heavy spots improved the organic matter situation.

All of these practices went along with a horsepower era and tended to promote good soil structure or granulation resulting in the movement of water into the soil and not off of it. The fact that the soil was porous promoted aeration at lower depths, which resulted in more root development in the second and third foot of soil. Consequently, in horsepower days it took a longer drought period to injure crops.

After the horse was thrown off the vegetable farm because he was a Sunday and holiday chore, steel-rimmed, cleated tractors took over. They covered more ground with less effort than the horse and could even be used to cultivate and pull loads of produce out of fairly wet fields.

All of this didn't help soil conservation and certainly ruined a lot of soil structure. However, it took the rubber-tired tractor with even better traction to really do a thorough job of destroying soil structure. It completely compressed, compacted, and destroyed the structure of soils that were worked or run over when too wet. A nimble-footed horse pulling a walking plow or cultivator certainly didn't begin to cause the structure and aeration troubles that have developed since the advent of the rubber-tired tractor.

Certainly the tractor has multiplied labor efficiency many times and is indispensable to our present economy, but it hasn't helped the soil moisture situation or the ability of plants to obtain moisture from subsurface soil.

A number of years ago a study was made of the effect of a drought period on the snap bean crop in a canning area. Using a pointed steel rod, it was found that as the pressure required to push the rod into the subsoil increased, the height of the bean plants decreased. Apparently the beans were not able to push their roots deeply into the subsoil and use moisture that was there.

Droughts are becoming more frequent, not because of less rainfall but because the water is not as completely stored or as completely available to crops. Soil conservation practices that add organic matter and promote granular soil structure are becoming increasingly important, both to the irrigator and to the non-irrigator in a horseless agriculture, and if followed will aid in reducing the effects of seasonal droughts.

Johnny Gardenseed

JOHNNY APPLESEED. Johnny Gardenseed.

Probably everyone has heard of Johnny Appleseed, a legendary character who, out of the goodness of his heart, planted apple seeds wherever he went through the countryside. But who has heard of Johnny Gardenseed? He is no legendary figure, but a generous American sailor who distributes vegetable seeds where he finds a need for them around the globe.

He is Aloysius Eugene Francis Patrick Mozier, American Merchant Marine who has seen death and suffering in his travels and who is doing something about it.

Mozier first became aware of malnutrition a couple of years ago in Korea where he saw a little four-year-old native girl collapse along the road near Pusan. In his jeep he whisked her to a hospital, but she was dead when they arrived. The doctor called it malnutrition.

This gave Mozier the urge to do something about the tragic situation, and since that time he has distributed more than 200,000 packages of vegetable seeds. A few private citizens who know of Johnny Gardenseed's project have contributed, but mostly he has paid for the seeds himself. Recently, on return to Los Angeles, his home base, Mozier withdrew the last $1,500 of his savings to buy more seeds. And so he is called Johnny Gardenseed.

Everyone deplores the tragedy of want, and many devote hours to talking about "conditions." But Aloysius Eugene Francis Patrick Mozier grabbed the situation with both hands and did something. He deserves all that is implied in the monicker of "Johnny Gardenseed."

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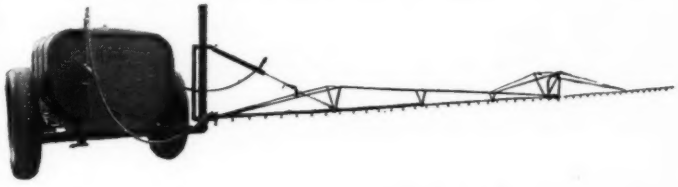

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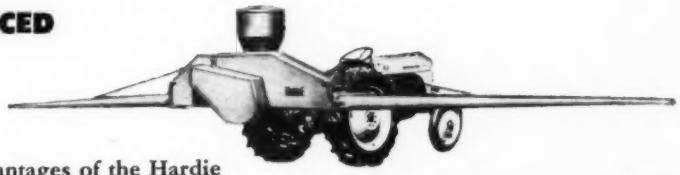

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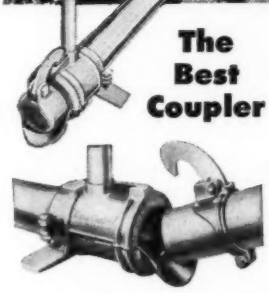

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